The colony is compared with the blastula stage of animal embryology, and has a pore like the blastopore. The antheridium develops in the blastula fashion with a "phialopore," as does also the new colony, whether formed asexually or from the egg. The figures are very diagrammatic, but interesting and probably accurate. No nuclear detail is attempted. The most striking feature of the paper is the terminology. Every structure has a technical name, even when ordinary literary French would serve as well.—CHARLES J. CHAMBERLAIN.

NOTES FOR STUDENTS

Inheritance in maize.—COLLINS[7] has made some interesting observations on the progeny of an all-white ear of maize that appeared suddenly in a field planted with a variety known as Gorham yellow dent. Since the character with which he was dealing develops in the endosperm and usually shows complete dominance in crosses, this variation is out of the ordinary. The author classes it as a case of mutative reversal of dominance. To the reviewer such a view respecting the phenomenon seems unwise. In the descendants of the seeds of this ear, yellow was dominant to lack of yellow in varying degrees; it only remains then to explain the non-development of yellow in the original aberrant ear. It has been generally accepted that dominance or lack of dominance is only another way of describing the somatic appearance of a heterozygote. It has nothing to do with segregation and is valuable simply as an indication of zygotic composition. The true classification of any individual can be determined only by breeding from it, for there are characters so variable in their dominance that the appearance of the heterozygote may be similar to either homozygote (*AA* or *aa*). In spite of its variability, however, dominance does not just happen. It has its causes. An individual *AA* may be crossed with various kinds of *aa* individuals and the degree of dominance be different in each cross, but these various manifestations are due to internal differences between the *aa* organisms. On the other hand, external conditions may affect the manifestation of a character either when in a heterozygous or when in a homozygous condition. One may assume, therefore, that dominance is not a phenomenon of great variability when both external and internal conditions of development are identical. For these reasons, the reviewer has a suspicion that COLLINS' mutative reversal of dominance was nothing but suppressed development due to some abnormal environmental condition, possibly the accidental presence of some particular metallic salt in the spot of soil in which the plant grew. The reviewer has observed somewhat similar phenomena, but has never thought his own ignorance of their exact cause a sufficient excuse for an attack on well established theories.

Seeds from COLLINS' "albinistic" ear were planted and the progeny investigated. His results show clearly that he was dealing with the behavior of two

[7] COLLINS, G. N., Heredity of a maize variation. Bur. Pl. Ind. Bull. 272. pp. 23. *pl. 1. fig. 1.* 1913.

factors for yellow endosperm, Y_1 and Y_2, of which one is much more effective in producing the yellow pigment than the other. Such an assumption he regards as "violent," it being just as violent as have been the assumptions of all Mendelian experimentalists who have made mathematical interpretations of breeding facts. The author is also greatly disturbed over the question of whether or not the segregation ratios that he obtained fit the theory of error. It seems to the reviewer, however, that considering the possibility of experimental error in work with maize, he is to be congratulated on having done some very careful work to have them fit "theory" as well as they do.

Notwithstanding the fact that the results obtained agree well with the assumption of two yellow factors that are given above, with only a few minor variations of classification due to the difficulty of distinguishing light yellows from white, the author concludes "that while the segregation is usually numerically exact, it is by no means complete; that is, the dominant character is not completely absent from individuals of the recessive class." "This," he says, "is shown not only by the presence of a faint yellow color in most of the seeds, but also by the fact that apparently pure white seeds from an ear in which the classes were well marked may produce seed with a fully developed yellow color when self-pollinated." Consequently he favors the idea of gametic impurity in the sense that extracted dominants and recessives may transmit traces of the alternative character.

Again this conclusion seems opposed to the facts submitted. If one has a set of light yellow and white seeds in an apparent ratio of 3:1, he makes his classification as best he may by somatic appearance. He then grows the whole series and finds out *what the true classification of the parents was.* This the reviewer has done on similar material, with the result that the ratio of the mother seeds *proved* to be 3:1; this the author either has not done or has not reported. If then the *white ears* obtained do not again breed true, one might have the right to assume gametic contamination; but the author reports no such evidence. As a matter of fact, extracted recessives and extracted dominants do appear to throw the alternative character on rare occasions, but the phenomenon is so rare that one may better assume that a germinal rearrangement (mutation) has occurred. Of course in any species some variations are more likely to occur than others, which may be taken as evidence of a kind of latency. But this is only the kind of latency that is analogous to the tendency of a chlorine atom to split off from a complex benzene derivative, rather than one of the more conservative radicals such as methyl. It is evidence that certain rearrangements in a particular germ plasm are more likely to occur than others.—E. M. EAST.

Studies of Nicotiana hybrids.—In two papers, appearing almost simultaneously, GOODSPEED[8] has reported the results of his investigations on

[8] GOODSPEED, T. H., Quantitative studies of inheritance in *Nicotiana* hybrids. Univ. Calif. Publ. **5**: no. 2. pp. 87–168. *pls. 29–34.* 1912; *ibid.* no. 3. pp. 169–188. 1913.